DOCUMENT RESUME

ED 115 445 RC 008 906

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TITLE The Possible Application of Socioeconomic Careers and Path Analysis Concepts to the Study of Factors Relevant to Physicians' Choice of Practice Location.
PUB DATE Aug 75
NOTE 28p.; Paper presented at the Annual Meeting of the Rural Sociological Society (San Francisco, Calif., August 21-24, 1975)

EDRS PRICE MF-$0.76 HC-$1.95 Plus Postage
DESCRIPTORS *Conceptual Schemes; Critical Path Method; *Geographic Distribution; Models; *Physicians; Research Criteria; *Research Methodology; *Rural Areas; Socioeconomic Status; Statistical Analysis; Vocational Development
IDENTIFIERS *Socioeconomic Careers Model

ABSTRACT

In response to the current shortage of rural physicians and the difficulties encountered in studying this problem, this paper attempts to apply a specific multivariate technique (path analysis) and the socioeconomic careers model of Featherman and others to the study of the physician's choice of practice location. The socioeconomic careers model is utilized as a heuristic device along with suggestions for its modification to make it more useful in the case of the physician. The specific classes of variables employed by Duncan and Blau are described in detail (background, intervening, career contingencies, and outcome variables). Certain of the specific aspects of the physicians' socioeconomic career are discussed. Differences between the generalized model and that found useful for the physician are pointed out (emphasis is on the use of many, rather than a few, variables). Consideration is given to discussion of path analysis as a type of multivariate analysis. The technique is then applied conceptually to the case of the physician's socioeconomic career. Specific variables are considered along with the conceptual difficulties they may present. Characteristics of actual recruits to medical careers are enumerated as indicative of how the model must be modified to be useful. (JC)

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THE POSSIBLE APPLICATION OF SOCIOECONOMIC CAREERS AND PATH ANALYSIS CONCEPTS TO THE STUDY OF FACTORS RELEVANT TO PHYSICIANS' CHOICE OF PRACTICE LOCATION

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Paper to be presented at the Annual Meeting,
Rural Sociological Society,
San Francisco, August 21-24, 1975

ED008906

A. Introduction

The present paper is one of four in a series by the writer having to do with primary and secondary health care experts. (Grimes, 1973a; Grimes, 1973b) It follows a paper completed last year which concerned itself with the problems of multivariate analysis of factors relevant to physician choice of rural or non-rural practice location. (Grimes, 1974) In writing the prior paper, the writer described a number of possible analytical techniques thought useful in such efforts, one of them being path analysis. The present paper attempts to go beyond suggestion of the technique to actual exploration of its application.

Having categorized the paper in the context of its precedessors, one should also characterize its point of view and approach. Basically, it sees the rural physician's choice of practice location as part of the larger congeries of phenomena which Featherman and others have designated the socioeconomic career.[1] (Featherman, 1971b; Kelley, 1973)

From what has been said, at least two salient facts emerge. This paper is to be construed as an elaboration of a prior effort; first, an attempt to apply a specific multivariate technique, path analysis, to the problem of physician choice of rural practice location and second to apply the conceptual and theoretical schema which goes along with the path analytic model, that which treats of socioeconomic career. This is what the paper seeks to do, not in a fully ramified sense because there is no statistical testing of empirical data, but in an exploratory way. This seems a logically prior step before actual empirical testing.

B. Earlier Studies of the Physician's Career

The contribution of the present paper does not lie in the fact that it is first in looking at the physician's career longitudinally; as far as presently known, its application of socioeconomic career approach has not been done by others. However, basic studies of such matters have been extant for several decades. A good number of these studies originated with Everett Hughes and certain of his students, particularly Eliot Freidson.[2] (Becker, 1972; Hughes, 1958; Freidson, 1970a; Freidson, 1970b; Freidson & Lorber, 1972) In substance, what should be said is that the writer feels that the use of the socioeconomic careers model allows one to be both more sophisticated and ultimately more quantitative in approach. This is the sense in which it may represent an advance.

C. The Rural Physician's Career--A Subtype

When one compares the amount of data available on the career patterns of the rural physician with that already accumulated on physicians in general, its paucity is notable. Until very recently, this was true with regard to data on rural medical problems in general, with the older, classic work of Mott and Roemer constituting almost the sole exception. (Crawford, 1971; Crawford, 1972; Mott and Roemer, 1948) This work dates from 1948 and is obviously out-of-date in the basic statistical sense.

There are several ways in which one can get around this problem, both of which involve perusal of the journal literature. First, one can examine data on the career choices of medical students and "piece together" evidence regarding socioeconomic careers. (Bible, 1970; Cooper et al, 1972) Second, one can look at materials or studies of health manpower shortages which impinge on the problems that rural communities have in obtaining physicians. (Becker, C. et al, 1973; Marden, 1966; Mason, 1971; Mullner & O Rourke, 1974;

Office of the Budget: Harrisburg, Pa., 1971; 1972a; 1972b; Report of the National Advisory Commission on Health Manpower, 1967; Tokuhata, 1972; U.S. Congress, 1971) This obviously reflects certain aspects of the kinds of socioeconomic careers currently (and retrospectively) being undertaken. (Heald and Cooper, 1972)

A definitive discussion of the rural physician's career will not be attempted in this programmatic paper. The references cited indicate that materials for such a task are available. To set the question in context, the writer wishes at this point to interpolate material from his preceding paper since it deals effectively with two matters of current concern: 1. The nature of the problem of the rural physician shortage and 2. The difficulties encountered in studying the problem sociologically. The first topic concerns the rural health manpower crisis.

What has been done in lieu of a quite quantitative approach is to assess the situation in the health manpower area particularly with regard to the groups the writer has designated as primary and secondary health experts.

1. Problem

With regard to health manpower at both the national and state levels, the situation is that:

a) A general shortage of personnel exists although in terms of formal numbers, there may be more persons in a given specialty than heretofore. For example, there were a record number of medical graduates in 1974.

b) The crunch is in the distribution of physicians. They tend to preponderate in large urban areas and to be very scarce in rural and inner city domains. (Mullner and O'Rourke, 1974; Elash and Schollaert, 1972) This is particularly true of specialists.

2. Purported Resolution of Problem

a) The magnitude of the problem is evident. On the one hand, the contemporary practice of medicine has become an inordinately complex undertaking, both scientifically and bureaucratically, and thus harder to accomplish in a bucolic milieu. On the other, persons living in such areas need medical assistance when ill.

A related situation reflected in a tremendous enhancement of demand for physicians' services has in a sense, exacerbated such problems. (Grossman, 1972; Acton, 1973a; Acton, 1973b)

b) Attempts to resolve this problem include the urging of increased use of allied or ancillary health personnel in a basic attempt to free the trained physician from his more mundane chores so that he can see and treat more patients, i.e., increase his productivity. Another tack which hopes for the same result encourages formation of group practices with again a postulated increase in physician productivity from projected "economies of scale." This term has to do with mutual benefits accruing those in group practice through the sharing of common costs and facilities and the like.

c) Use of allied health personnel and attempts to enhance productivity through group practice helps the problem situation but probably not as dramatically as foretold. Ancillary personnel who become well-trained exhibit no more altruism than do physicians and visualize themselves in a optimal position on an upwardly mobile career ladder. Increases in marginal productivity in physician's groups through effectuated economies of scale are, according to the research reports of one massive investigation, not as striking as comtemplated earlier on. So "disjointed incrementalism" still obtrudes as the strategy of the day. (Dahl and Lindblom, 1953; Lindblom, 1968; Braybrooke and Lindblom, 1970)

The Physician as the Central Source of Medical Care

Implicit if not explicit in all the prior discussion is the fact that the physician's place as the central source of medical care has attenuated considerably. This position of eminence lasted roughly five decades or from the publication of the Flexner Report (circa 1910) to the mid-1960's when Lyndon Johnson and a mesmerized Congress got through a plethora of health and welfare legislation including the precursors of our present Medicare and Medicaid systems. Put another way, the time-span encompasses the period from the point at which physicians began to be taken seriously as health care providers until the later point when alternatives to conventional solo practice began to command public attention. When bureaucratic innovation novelty, artifice and countermores begin to evolve and impinge the apogee of prestige had passed.

One dramatic consequence of the changes in both rural medical practice and the doctor's status as health expert is a shortage of physicians. As Sabine (1951) once said in another context "Such a conjunction of attributes (serves as) an invitation to paradox." In other words, if the physician has lost charisma and status, if he is no longer the only source of medical source, why worry about his absence? A partial answer to this is that by training, experience and legal mandate, physicians are enabled to perform whole clusters of activities which are precluded for others in the health field. He has to be taken seriously for that reason; consequently, lack of trained physicians does comprise a social problem, particularly in rural contexts and in the disadvantaged areas of the inner city ghetto. (Bullough and Bullough, 1972; Norman, 1969; Goodrich, Olendzki et al, 1970; Mechanic, 1971)

If one wished to be concise about the matter, one could sum up the situation (with appropriate documentation interspersed) (Mott and Roemer, 1948; Heald and Cooper, 1972) in a series of short statements:

a) A shortage of providers of primary care exists in rural areas. This was documented in 1967 by the National Advisory Commission on Health Manpower as a nationwide problem (National Advisory Commission on Health Manpower, 1967). Other studies document this shortage in the state of Pennsylvania. A study conducted by the Office of Budget, State of Pennsylvania, concerns the shortage of primary care providers such as general practitioners, family practitioners, internists and pediatricians. (Governor's Office, State of Pennsylvania, Office of the Budget, 1971, 1972a, 1972b)

b) There is a maldistribution of physicians by medical specialty and geographic location. Study of Pennsylvania health manpower confirms these data and shows the dispersion of physicians by geographic area.(Tokuhata et al, 1972)

c) These shortages are acute in rural areas and in urban inner city areas as well. Documentation of this point in urban contexts has already been given. (Bullough and Bullough, 1972; Norman, 1969; Goodrich, Olendzki et al, 1970; Mechanic, 1971)

d) Varied forms of Galbraithian "conventional wisdom" have been enunciated to help alleviate the problem including the application of monetary incentives and greater use of paramedical personnel to increase overall productivity. To be more specific, one can mention three different approaches:

   (1) Attempts to increase the supply of physicians in shortage areas through forgiveness loans to medical students; this tack has been generally unsuccessful. (Mason, 1971)

   (2) Through stipends to medical schools to increase enrollment of students who would practice in such areas. (U.S. Congress, an Act to Amend Title VII of the Public Health Service Act, 1971)

   (3) Through grants to communities in shortage areas to entice physicians to their area. (Lavin, 1972)

To sum up the situation succinctly both in terms of policy-oriented programmatic research and in terms of actual programs themselves, prior approaches have been both discrete and fragmentary. The present paper hopes both to be a review of past efforts and to serve as a prospectus for future work in the area which is more comprehensive in its scope. A comprehensive review of past work from the standpoint of a multivariate analysis approach reveals the following trends:

a) The development of many spurious generalizations about the phenomena under examination. They are based generally on fragmentary evidence and would have to be categorized as idiographic rather than nomothetic in character.

b) Most of the studies have "inadequate" samples in some regard or another.

c) Like comments can be made about the other "axis" of the problem; that part which concerns the use of paramedical, i.e. auxilary personnel of some sort to both supplement the efforts of practicing physicians and make up for the lack of practitioners.

At this point, the writer wishes to interject further material relevant to the multivariate analysis of physician location problems. A proposed study by social scientists from the Pennsylvania Department of Health suggested an exploration of three facets of the problem before state funding of another new program in the area. (Becker, Digon and Miller, 1973) These facets were as follows:

a) Development of an adequate statistical data base to substantiate reasons why young physicians will not settle in rural/urban areas.

b) Determination of the "price" physicians would demand to settle in communities of varying population densities.

c) Productivity factors of private practices and medical centers sponsored fully or in part by the Commonwealth. (Newhouse, 1973; McCormack and Miller, 1972; Theodore and Yett, ____; Reinhardt, 1972; Phelps and Newhouse, 1972; Phelps and Newhouse, 1973; Acton, 1973a; Acton, 1973b)

Without trying to be too definitive (the curious are referred to the papers previously cited for that purpose) some of the specific limitations of previous studies should be pointed out. There have been some deficiencies in the sampling procedures. Certain studies made of physician's reasons for rural practice have been fragmentary in nature; in addition they were confined to small samples of medical students in one state. (Bible, 1970; Borland, Williams and Taylor, 1972; Cooper, Heald et al, 1972) In addition, one of these efforts used a mail survey of a sample of AMA members. However not all doctors, especially younger ones belong to the organization. In addition, findings derived from one state may be inapplicable in another. In addition, the scope of many of these studies is very diffuse including many physicians who are not involved in primary care. Medical specialists such as surgeons who do not give primary care may reside in certain areas because of the availability of hospital facilities in the area.

This is not usually the case with general practitioners; at least, it is not as important a factor.

None of the prior studies look at all possible variables behind the physicians' choice of a practice location. A multivariate approach is necessary for the isolation of the most important factors. Further, these studies typically have been retrospective, that is, they study reasons for location in a given area after the fact. Physicians are found practicing in a given area; the investigators try to ascertain how they got there. Physicians are not typically interrogated prior to choice of location. In addition, as has been already noted in passing, the samples in many of these

studies are relatively limited in size and also undifferentiated by medical specialty thus placing severe limitations on the scope of the conclusions that can be reached.

At the present moment, the proper way to conduct a really adequate study in the area of physician location would be as follows: first, to examine together the relative impact of all the several factors found to influence the decision to practice in a rural or inner-city area (after these can be described as personal or background factors, professional practice factors, and community factors) (Cooper, Heald, et al, 1972); then second, to take these factors and study them prospectively over time, both to determine their relative importance--as single entities and perhaps in synergistic combinations--in the decision of where to practice before and after it has been made. A third approach differing from past studies would be to use a statewide sample of recent medical graduates who, subject to conventional problems, could be assessed longitudinally as they went through the usual occupational milestones of internship, residency (if applicable), first practice location, second practice location up to the nth practice location. (Cf. Becker, Hughes, et al, 1961)

Such a study would do at least three things:

a) It would determine which one or more of the set of relevant factors specified are important in explaining where a physician locates his practice. Put abstractly, it would determine hierarchy and causal priority.

b) It would also reveal which of these factors are most important in the location decisions of the various medical specialities. Put another way, is there a generic congeries of factors basic to all locational decisions; are such decisions discrete for each medical field or is it a kind of theme and variations situation? The last seems the most inherently plausible of the three explanations.

c) Finally, such a research would elucidate the varied paths to types of practice location and try to ascertain the relative permanency of this decision.

As far as specific multivariate analysis techniques are concerned one can of course mention conventional factor analysis, standard correlation and regression methods or possibly even Tryon's cluster analysis. The writer wishes to briefly specify another possibility.

As a kind of coda to this section on analytical techniques it appears possible to use the technique of path analysis in the exploration of the problem of physician location. (Land, 1969; Duncan, 1966; Crowder, 1974) Any multivariate approach to this or other questions of "organized complexity" must utilize a technique or techniques to determine at least two things: the relative hierarchy or importance of variables and the pattern of causal relations obtaining between them. Path analysis is one such method.

D. The Physician's Work Experience as a Type of Socioeconomic Career

All of this discourse is prelude to the real matter at hand; the application of the concept of socioeconomic career to the work experience of the physician and its bearing on factors salient to the physician's choice of practice location, rural or otherwise.

The first thing needed is a more detailed account of this concept. The account follows closely that of Duncan, Featherman and Duncan and for heuristic purposes ignores certain embellishments that others, notably Kelley, have added. Duncan, Featherman and Duncan enumerate and describe four classes of variables: background variables, intervening variables, career contingencies and outcome variables. (Duncan, Featherman and Duncan, 1973:10-15) To show how these classes of variables are to be employed in the later account of the physician's work career it seems appropriate to give a description of each and what kinds of specific variables are listed under it.

1. Background Variables

Under this heading are a number of diverse variables which might be thought of being of significant and less significant importance. The principal significant ones are father's education, father's occupation and family size. In the language of path analysis, they are endogenous factors to be regarded as "givens" of the model; the ultimate independent variables in the whole causal process. These variables are relatively easy to characterize and are often used in studies of social mobility. Duncan, Featherman and Duncan point out that though they do not exhaust the total number of possible indexes of "socioeconomic background", "There is reason to believe they tap much of the variance associated with alternative or additional measures." (Duncan, Featherman and Duncan, 1973:6)

The background variables of secondary importance include national origin, race, number and sex of siblings and family stability. These are mostly ascribed statuses in that one's position in all these regards stems from occupancy of some position in some family of orientation.

2. Intervening Variables

A second class of variables can be described as intervening in nature; that is, they stand, in media res, between "cause" and "effect"; in this case between the endogenous background variables and the goal or end state: choice location. The most notable ones mentioned by Duncan, Featherman and Duncan are intelligence, aspirations and motives and social influences. Obviously the presence or absence of educational attainment in a given social actor serves alternately as facilitator or retardant, in terms of optimal goal-fulfillment in the occupational world. This being said, it should be further stated that behind educational attainment are other perhaps more basic intervening variables, namely intelligence and motivation. With respect to the first, Duncan, Featherman and Duncan point out that intelligence as measured by standard tests is "essentially scholastic aptitude." They raise two questions in this regard: "What is the impact of family, if any, on schooling?" and "Does it operate via intelligence?" "Also, if intelligence influences achievement, does it do so solely through formal educational achievement or does it operate partly outside the attainment of amount of schooling?" (Duncan, Featherman and Duncan, 1973:12)

The other basic intervening variable, motivation, is even more protean in its manifestations. The most perduring of these are called motives; Duncan, Featherman and Duncan note, however, the existence of more nebulous constructs such as goals, values, aspirations, dispositions

and the like. Other concepts in this area include "plans", "intentions", "need for achievement", "occupational aspirations", "college plans" and others.

A final group of intervening variables are called "social influences." These concern the patterns of social interaction existing between an individual and certain "significant others" in his social milieau that both influence him and alert him to opportunities. The impacts of the family of orientation and the peer group suffice as examples.

3. Career Contingencies

This class of variables might also properly be regarded as intervening ones, but are sufficiently distinctive as to be dealt with separately. Career contingencies are defined by Duncan, Featherman and Duncan as "decisions taken or circumstances encountered in the course of the life cycle that may have significant bearing upon occupational outcomes." (Duncan, Featherman and Duncan, 1973:13) They may relate both to background factors and to other intervening variables and thus modify the influence of either on occupational achievement. When looked at in a different manner such factors could be construed as a series of more detailed stages in the life cycle or at least in the socioeconomic career. Duncan, Featherman and Duncan point out that they are not encountered on any fixed temporal order (1,2,3. . .n) nor do all persons encounter them in the same way. Their number is large; the prototype study here deals only with five: age at first job; occupational level of first job; residential mobility, marital status; and fertility, construed in the sense of size and timing of increments to the family of procreation.

4. Outcome Variables

The most prominent of these is occupational status. Other significant entitates include income or earnings and varied measures of what Duncan, Featherman and Duncan call "subjective achievement." The latter concept might include such things as job satisfaction, social class identification, and feelings of economic or status security-insecurity.

In terms of a generalized process of upward occupational mobility, a prototype would look like:

Ascribed status
*
*
*
Achieved status
*
*
*
Desired occupational goal state

The major part of the paper is concerned with the application and elaboration of these concepts with respect to the socioeconomic career of the physician. First some general comments are in order. It appears fairly obvious that some modification of the conceptual scheme is necessary when the physician's career qua career is considered. It strikes the writer that the principal "difference" in the physician's socioeconomic career is the complexity of the apprenticeship situation the neophyte physician confronts. This approach may sound akin to the late James Caesar Petrillo's remark, when as head of the American Federation of Musicians, he stated that "To me, there's no difference betweer Jascha Heifetz and a fiddler in a tavern." Medical careers, shorn of their mystique and charisma, are secular events susceptible to scrutiny. The principal anomalous characteristic which obtrudes is the series of gradations through pre-medical training, medical

school internship and residency (if one is taken, as is increasingly the case these days). This adds up to a very complex and arduous apprenticeship situation which differs in many senses from that encountered for example by one striving to become a "barperson" or from student teaching at the secondary level. Naturalistically the process is not a whit different.

E. Technical Areas: Multivariate Analysis and Path Analysis

One of the principal themes of the writer's prior paper concerned the advantages of multivariate approaches to the analysis of factors relevant to physician choice of rural practice location. (Grimes, 1974:29-30) These more sophisticated approaches were contrasted with many older studies which were monocausal or which focussed on only a few of the many relevant factors. Various multivariate techniques were mentioned in passing, including Tryon's cluster analysis, multiple factor analysis, and the present technique, path analysis. The possible utility of a simulation approach was also discussed. An addendum to this is the use of Markov chain models, which have had utility in the study of occupational mobility. (McGinnis, 1968; McFarland, 1970) The thrust of the present section is not, however, to comment elaborately on other multivariate techniques nor is it even to give a detailed explication of path analysis. Data are available which do this very thing and can be perused in the footnoted sources appended. (Duncan, B., 1965; Duncan, O. D., 1966; Land, 1969; Nygreen, 1971) The important point really concerns the overall use of these differing but essentially similar techniques. They have their common denominator, if you will, in the need to disentangle the web of causality in situations where a number of factors combine, usually in quite a subtle way to produce some identifiable end-result. What one finds is either a single organism, a collectivity or "artificial collectivity" (Duncan, Featherman and Duncan's synthetic cohort) (Duncan, Featherman and Duncan, 1973:37-45; Featherman, 1971b) starting at some given ground state,

embarking on some course of action and arriving through longitudinal perserverating action at a terminus a quem through completion of a kind of consummatory behavior.

All this as just stated smacks highly of the jargon of the psychologist; however its terms can be transmuted into sociological language fairly easily. What it means in the present context is that one must look essentially at three classes of variables: 1. those relating to the ground state of the organism, collectivity, synthetic cohort or whatever; 2. those which are a function of the processual transformations the organism goes through; 3. those which characterize the end-state; after consummatory action or at least surcease has been achieved. Again harking back to stock sociological usage and particularly to the argot of path analysis, the first class of variables here described are conventionally labelled exogenous variables as somehow "external" to the system of action. This of course includes background variables. The second class processual in nature, are often described as endogenous (internally generated, etymologically speaking) autochthonous to the system under study. In the case of Duncan, Featherman and Duncan's schema, the categories of "intervening variables" and "career contingencies" would be included. The third and final class of variables concerns the consummatory phase or end state of action are labelled outcome variables by Duncan, Featherman and Duncan.

F. Path Analysis: Its Application to the Physician's Socioeconomic Career

We thus come to the crux of the problem which the paper confronts; it does not solve it but confronts it. As adumbrated dimly earlier on, the difficulty inherent in trying to use a path analytic-socioeconomic careers approach to physician's choice of practice location is that when one analyzes the models developed by Duncan, Blau, Featherman and others, one finds

relatively simple if not simplistic models with regard to the nature and range of variables encompassed. This has been done with an eye both to ease of manipulation and in deference to the canons of scientific parsimony. As Robin Williams once remarked "One must trim Plato's beard with (the aid of) Occam's razor." But this in turn poses problems with an occupation such as that of the physician, where in general the role incumbent must be an exceptional person in many aspects of life; this must be reflected in a high position on whatever collection of indices is chosen. Thus a richness of context and an interweaving of variables is almost mandatory.

About all that can be done further is to offer suggestions for the future choice of additional variables with advice for their optimal treatment. In addition, one should answer the question of how these particular variables were selected, i.e., the requisite criteria of choice. In this regard, something also must be said about the kinds of people recruited to the occupation of physician. As just noted, the physician, if at all functionally competent, must be some species of exceptional person. A bit of data about the kinds of persons recruited to the occupation suffices to make the point. From a plethora of literature sources, one may interpolate a brief summary of data on the recruitment process:

1. Such persons are generally from higher socioeconomic status backgrounds.
2. The fathers of those recruited tend to be professionals, proprietors and managers occupationally.
3. Of course, there is some tendency toward liberalization of the selection process, particularly in the search for minority group students ongoing at present.
4. One of the interesting features surrounding recruitment of students

> to the "profession of medicine" has to do with the enhancing nature of the socialization process. The aid of parents having professional occupational backgrounds is often crucial in helping students gain admission to undergraduate and medical school. Other students from more diffuse backgrounds have less informed aid in their decision-making processes. The practice of clinical teachers also may have considerable impact. (Becker, Geer, and Miller, 1972:192)

This brief survey is necessarily somewhat impressionistic but hopefully conveys some of the characteristics of those who choose to go into medicine. By pointing out certain characteristics, it also indicates some of the ways in which the socioeconomic careers model and the later path analysis procedures for the study of the physician can be put together.

As indicated earlier on, the models set forth by Blau and Duncan, later elaborated upon by Duncan, Featherman and Duncan and others in both book and journal form are generally "oversimple," in that too narrow a range of variables are considered. Among the "background" variables, usually only education and occupation of male parent is considered. Since these variables are relatively strong in terms of the value of the coefficients of determination, it is not surprising that they are emphasized. Other background variables such as family size among those regarded as primary and national origin, race, number and sex of siblings and some measure of family stability are also worthy of mention. The problem is one of translating their essentially qualitative natures into something that will be more easy to assess quantitatively.

The same is true of two of the three major intervening variables, aspirations and motives and social influences. The third in this triad, intelligence, is more generally quantitative in nature and thus amenable to the kind of treatment advocated in this paper.

What is the basic question in the elaboration or extension of the model? As far as choice of variables, one might make the general comment that what is necessary is a renewed choice of variables appropriate for an occupational group receiving specialized training of an elaborate and prolonged sort with a complex apprenticeship along the way with a certain minimum high intelligence quotient being required and a welter of psychological traits and attitudes acquired somewhere along the line perhaps obtainable through a designed or positively serendipitous socialization process. The writer certainly thinks that the retinue of variables employed by Duncan, Featherman and Duncan constitutes a minimum.

Some additional tasks must be assayed. For example, the general process of trying to quantify what are more or less qualitative variables presents a difficulty. An ancillary chore arises from the fact that whatever collection of variables is employed in this or any other proposed path analysis, those chosen are not (nor perhaps can they be) particularly similar in nature. By this, one means in terms of the usual designation of scales of measurement: nominal, ordinal, ratio and interval, where the last two are basically quantitative and the others not. (Coombs in Festinger and Katz, 1953:473-484; Blalock, 1960:11-16) Of course, this question can be handled in part by the use of dummy variables and the use of multiple classification analysis techniques. The analysis of covariance is also useful in some cases. (Blau and Duncan, 1967:128-132;147-152)

One other caveat the writer would like to insert at this point is that one should not assume that the processes under study are too simple. In his article on the socioeconomic career Jonathan Kelley makes this very point in arguing for a dualistic approach to the problem. (Kelley, 1973) Harking back to the original formulations of Duncan and Blau, Kelley tries

to replace their single causal chain model measuring the impact of income and education with a double model; one each for income and occupational attainment. Both variables are seen as the outcome of modified causal chains with income affected only by education, current occupation and past income; while occupation structured solely by education, family background and immediate past occupation. This approach is offered as an alternative to the "historicist" model proposed by Featherman with its much less pronounced emphasis on the waxing or waning of putative causal agents. (Featherman, 1971a; Featherman, 1972b; Featherman, 1972)

A third point is that social psychological as well as more strictly sociological variables should be considered when a ramified conceptual scheme of this sort is envisioned. Lipset and Bendix made this point many years ago; its reiteration is not redundant. (Lipset and Bendix, 1963:278-287)

G. Summary: Retrospect and Prospect

In the final chapter of one of his books, George Homans stated that ideally such a chapter should resemble an orgy after harvest.(Homans, 1959) If this be so, perhaps the orgastic level at present should be slight for the harvest does not appear over-bounteous. One could contrast this comment with one by Santayana who stated somewhere that although the owl in the treetop is not Chaunticleer crowing in the barnyard, he is sacred to Minerva. Logomachy aside, the theoretical yield if not bounteous at least appears meaningful. It can be summed up in the following general statements:

1. Getting adequate personnel and facilities to cope with rural medical problems is difficult.
2. Part of the reason is the generalized reluctance of medical personnel particularly physicians to set up practice in such areas.

3. Both for theoretical and practical policy-oriented reasons, much research has been done on the question in terms of health manpower studies and with regard to choice of practice location in the case of physicians.

4. Much of this research has been both myopic in policy perspective terms and simplistic in methodological ones. The writer and others have urged the use of multivariate techniques as an improvement to prior monocausal efforts.

5. The present paper has analyzed further these questions utilizing a dual set of borrowings fron Duncan and Blau, the socioeconomic careers model and a specific multivariate approach known as path analysis.

6. After describing the social situation facing rural medicine and the rural physician, the socioeconomic careers model is utilized as a heuristic device along with suggestions for its modification to make it more useful in the case of the physician.

7. The specific classes of variables employed by Duncan and Blau are described in detail.

8. Then, certain of the specific aspects of the physician's socio-economic career are discussed. Further, differences between the generalized model and that found useful for the physician are pointed out.

9. After this, some consideration is given to discussion of path analysis as a type of multivariate analysis. The technique is then applied conceptually to the case of the physician's socio-economic career. Specific variables are considered along with the conceptual difficulties they may present.

10. After this, the characteristics of actual recruits to medical careers are enumerated as indicative of how the model must be modified to be useful.

This summary in a large sense speaks for itself; further comment appears superfluous. What remains to be done lies in the domain of retrospect and prospect, particularly the latter. In so doing, it appears useful to look at the two very related but separate entities that give the paper its theoretical and methodological foci: the socioeconomic careers model and path analysis. One states the obvious when it is noted that path analysis can be employed separately from the careers model. In the present case, it did not seem advisable to do so given the nature of the question under examination. At first another conceptual scheme having to do with choice of practice location was slated for utilization. But, upon examination, it was found to be so much inferior to that of Duncan and Blau that its use was discarded.

Now let us consider the socioeconomic careers concept. As the writer has stated, the application of it to the rather complex work life of the physician seems a viable enterprise. The complexity of the apprenticeship situation remains the most formidable object to be overcome. Moving from intellectual to practical realms, the actual implementation of an empirical research in this would have to cope with substantial "real-world" problems. Longitudinal career data on any occupational group is expensive to obtain and quite difficult at times to elicit. It would be particularly so from a busy prestigious occupational group such as physicians. Recourse to already gathered data from records (licenses and the like) is both less onerous and less meaningful. Thus both the conceptual and empirical problems stand.

As far as path analysis, its usefulness seems indubitable in this case. As noted, the conventional variables which have been utilized in previous studies of physician choice of practice location are a mixed lot at best, but it certainly appears that the use of certain alternative approaches, e.g., the "dummy variables" of multiple classification analysis or in some cases, the use of analysis of covariance can help surmount these difficulties.

As a kind of peroration to the present effort, the writer would again quote John Dollard on the putative usefulness of efforts such as the present one: "I would not have the reader think that I believe this (paper) to be a good example of scientific work in its best and terminal form. I see it rather as part of the exploratory work of science, of the fumbling and fiddling out of which more authorative descriptions of reality will emerge." (Dollard, 1957:viii) Such is the contribution which the present effort seeks to make.

FOOTNOTES

1. The phrase is Featherman's who has used it in several articles. (Featherman, 1971b; 1972) For a concise description and application, cf.(Kelley, 1973:481-485)

2. For initial bibliographic assistance see (Freidson, 1972:356-358). The writer's three previous papers (Grimes, 1973a, 1973b and 1974) also contain relevant citations.

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